

Appl. No. 09/993,737

## REMARKS

In the Office Action, claims 1-11 and 21-25 are rejected under 35 U.S.C. § 102 or, in the alternative, under 35 U.S.C. § 103; claims 26-35 are rejected under 35 U.S.C. § 103; and claims 12-20 have been allowed. Applicants believe that the rejections have been overcome in view of the reasons set forth below.

With respect to the rejection of claims 1-11 and 21-25, the Patent Office alleges that these claims are anticipated or, in the alternative, rendered obvious in view of U.S. Patent No. 4,025,608 ("Tawil") or U.S. Patent No. 3,416,884 ("Stynes") or British Patent No. 1,476,641 ("Marantz 641") or the INOUE publication. Applicants believe that this rejection is improper.

At the outset, the Patent Office merely alleges it would be expected that the zirconium phosphate granules as claimed are disclosed in the cited references. As a matter of law, clearly this is not sufficient enough to support the anticipation rejection. Indeed, what the Patent Office seems to suggest that there are differences between what the cited art allegedly discloses and what is claimed and that these differences are allegedly obvious modifications. See, Office Action, page 3. Based on at least these reasons, the rejection of claims 1-11 and 21-25 under 35 U.S.C. § 102 should be withdrawn.

In any event, Applicants believe that the cited references fail to disclose or suggest the claimed invention. Of the pending claims at issue, claims 1, 6, 21, 22 and 23 are the sole independent claims. Claim 1 recites a composition that includes zirconium phosphate granules synthesized using polyphosphate and zirconyl chloride under conditions wherein the pH of a mixture of polyphosphate and zirconyl chloride is at least 3.0 and the mixture is heated to greater than ambient conditions. Independent claim 6 recites a composition that includes zirconium phosphate particles with a particle size distribution such that approximately 97% of particles have a size of greater than 4 micrometers; approximately 90% of particles have a size of greater than 10 micrometers; approximately 75% of particles have a size of greater than 20 micrometers; approximately 50% of particles have a size of greater than 25 micrometers; approximately 25% of particles have a size of greater than 30 micrometers; and approximately 1% of particles have a size of greater than 70 micrometers.

Claim 21 recites a composition that includes zirconium phosphate particles obtained from sodium pyrophosphate that have a particle distribution as further defined in claim 21. Claim 22 recites a composition that includes zirconium particles obtained from sodium triphosphate

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particles that have a particle distribution as further defined in claim 22. Claim 23 recites a composition for removing ammonia from a fluid stream wherein the composition includes particles of zirconium phosphate synthesized using polyphosphate and zirconium salt wherein the composition has an ammonia absorption capacity of at least 0.8 mmol/g using an ammonia feed of approximately 7,000 micromoles/l.

The present invention provides improved zirconium phosphate compositions as well as methods of making and using same. Zirconium phosphate compositions of the present invention have a better particle distribution than the prior art. Moreover, the composition will provide for a better absorption of materials such as ammonia, calcium, and magnesium. See, Specification, page 2, lines 24-28.

In contrast, Applicants believe that the cited art, even if combinable, is deficient with respect to the claimed invention. For example, nowhere does the cited art disclose or suggest the zirconium phosphate features as claimed, such as the zirconium phosphate particle or granule features as defined in claims 1, 6 and 21-23. Indeed, the Patent Office merely suggests that it would be expected that the zirconium phosphate granules as claimed are disclosed in the cited art. Yet, Applicants do not believe that the specific zirconium phosphate particle features as claimed are disclosed in the cited art. This does not seem contrary to what the Patent Office alleges as previously discussed.

Further, Applicants do not believe that the cited art, even if combinable, suggests the claimed invention. Indeed, one of the unexpected advantages of the present invention is that far more uniform particles are obtained than with prior art methods. These uniform particles provide improved absorption characteristics and elimination of back pressure issues. In this regard, the product of the present invention can have a specific particle distribution as claimed and further supported in the Specification. See, Specification, page 7, lines 13-21. Moreover, Applicants have provided a number of examples and experiments that further demonstrate the advantages of the zirconium phosphate product as claimed over the prior art. For example, these advantages include an increase in ammonia absorption capacity that is greater than the prior art. It has been found that the particles of the present invention have an ammonia capacity of at least 0.8 and typically 0.8 -1.4 mmol/g using an ammonia feed of approximately 7,000 micromoles/l. See, Specification, page 7, lines 22-27. Therefore, Applicants do not believe that one skilled in

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the art would consider that the differences between the cited art and the claimed invention as mere obvious modifications.

Based on at least these reasons, Applicants respectfully submit that the cited art fails to disclose or suggest the claimed invention. Therefore, Applicants believe that the cited art fails to anticipate or render obvious the claimed invention, even if the cited art is combinable.

Accordingly, Applicants respectfully request that the rejection of claim 1-11 and 21-25 under 35 U.S.C. § 102 or, in the alternative, under 35 U.S.C. § 103 be withdrawn.

In the Office Action, claims 26-35 are rejected under 35 U.S.C. § 103 as allegedly unpatentable over Tawil or Stynes or Marantz 641 or the INOUE publication and further in view of U.S. Patent No. 3,669,880 ("Marantz 880"). In this regard, the Patent Office essentially relies on any one of Tawil, Stynes, Marantz 641 or the INOUE publication and thus relies on Marantz 880 to remedy the deficiencies of same. Applicants believe that this rejection is improper.

Of the pending claims at issue with respect to this rejection, claims 26 and 32 are the sole independent claims. Claim 26 recites a particle bed for removing a component from a fluid stream. The particle bed includes zirconium phosphate particles that have a size distribution as further defined in claim 26. Claim 32 recites a method of providing dialysis. The method includes the step of passing a dialysate fluid through a particle bed that includes a composition comprising granules of zirconium phosphate that are synthesized using polyphosphate and zirconium salt that was prepared by mixing the polyphosphate and zirconium salt at a pH of at least 3 and heating to a temperature of greater than ambient conditions at a molar ratio of 1/10 to 10/1.

As previously discussed, the zirconium phosphate compositions as claimed as well as methods of making and using the same have an improved and better particle distribution than the prior art. Moreover, the claimed compositions will provide for a better absorption of materials such as ammonia, calcium, and magnesium. This can be advantageous and useful in a number of different application, such as dialysis.

In contrast, Applicants believe that the cited art is deficient with respect to the claimed invention. Regarding the primary references, namely Tawil, Stynes, Marantz 641 or the INOUE publication, these references are clearly deficient with respect to the claimed invention at least for substantially the same reasons as discussed above. Thus, on their own, these references fail to disclose or suggest the claimed invention.

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Further, Applicants do not believe that the Patent Office can rely solely on Marantz 880 to remedy the deficiencies of the primary reference. Indeed, the Patent Office merely relies on Marantz 880 for its alleged teaching regarding dialysis and employing a particle bed. Therefore, Applicants do not believe that one skilled in the art would be inclined to modify the primary references to arrive at the claimed invention.

Based on at least these reasons, Applicants believe that the cited art fails to disclose or suggest the claimed invention. Therefore, Applicants respectfully submit that the cited art, even if combinable, fails to render obvious the claimed invention.

Accordingly, Applicants respectfully request that the rejection of claims 26-35 under 35 U.S.C. § 103 be withdrawn.

For the foregoing reasons, Applicants respectfully submit that the present application is in condition for allowance and earnestly solicit reconsideration of same.

Respectfully submitted,

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In re Patent Application of: Ton That Hai, et al.

**GRANULAR ZIRCONIUM PHOSPHATE AND METHODS  
FOR SYNTHESIS OF SAME**

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On the date stamped hereon the U.S. Patent and Trademark Office  
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1. Transmittal Letter (duplicate);
2. Response to Office Action (5 pgs.).

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